



1911 Washington Department of Agriculture

**SHORELINE MONITORING REPORT
MON LOUIS ISLAND RESTORATION PROJECT
USACE FINAL PERMIT# SAM-2014-01046-LET**

**FOWL RIVER,
MOBILE COUNTY, ALABAMA**

January 24, 2020

Prepared for:

**Mobile Bay National Estuary
Program
118 N. Royal Street, Suite 601
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INTRODUCTION

The Mon Louis Island (MLI) Restoration Project was implemented by the Mobile Bay National Estuary Program (MBNEP) with funding from the National Fish and Wildlife Foundation's Gulf Environmental Benefit Fund (NFWF-GEBF). The restoration project included construction of an approximate 1,540-ft. continuous rock (rip-rap) breakwater, and 4 acres of tidal marsh along the bay side of the northern tip of MLI at the mouth of east Fowl River in Mobile County, Alabama. The project also included maintenance dredging of the Fowl River navigation channel with funding from the State of Alabama through the Deepwater Horizon Incident (DWHI) grant application program. The constructed breakwater/marsh system provides protection for approximately 8 acres of tidal marsh that were restored during a previous project in 2005.

Project activities requiring approval from the U.S. Army Corps of Engineers (USACE) were authorized in Permit Number SAM-2014-01046-LET dated March 9, 2016. Among other conditions, the permit specifies that the permittee perform various pre- and post-construction monitoring activities in accordance with the "*Proposed Bathymetry, Shoreline, and Structural Monitoring Plan, Mon Louis Island Marsh Restoration, Mobile Bay National Estuary Program, version DRAFT (9-11-2015)*," (hereafter the *2015 Monitoring Plan*), which was submitted to the USACE by Thompson Engineering on September 11, 2015. This shoreline monitoring report is a provision of the post-construction monitoring activities required in the permit, as described in the *2015 Monitoring Plan*. The Vicinity Map in Appendix A shows the location of each of the subject shorelines.

PURPOSE

A review of historical aerial imagery of the tip of MLI revealed continuous erosion over the past few decades. For reference, a 1997 Historical Aerial from the United States Department of Agriculture/Natural Resources Conservation Service may be found in Appendix A. These changes are a result of both natural and manmade processes. Examples of natural processes include wave action, wind, and tropical systems. Manmade processes that can affect shoreline change might include bulkheads and other armoring, boat wakes, and dredging, among others.

A combination of both manmade and natural forces resulted in significant erosion at the tip of MLI that affected not just the marsh ecosystem but also threatened the homes and properties of the human inhabitants. The rock dike breakwater installation is a form of shoreline armoring. It has been documented that the armoring of one shoreline can result in changes to another adjacent or associated shoreline. This occurs because armoring potentially modifies the pattern of sand movement along the shoreline. Monitoring of the adjacent shorelines utilizing aerial photography provides insight into how the breakwater installation at MLI may affect adjacent shorelines within the vicinity of the project.

METHODOLOGY

Potential changes to shorelines north of the Fowl River navigation channel and shoreline areas adjacent to and south of the rock dike breakwater on MLI were evaluated utilizing existing and acquired aerial imagery to assess shoreline loss and/or accretion during the post-construction monitoring period. Shoreline change was evaluated by comparing available pre-project baseline aerial imagery to available post-project imagery. A variety of aerial imagery was used to assess what, if any, changes have occurred to adjacent shorelines after the construction of the breakwater:

- 2016 National Agriculture Imagery Program (NAIP) – 1 meter resolution
- 2017 Mobile County – 1 foot resolution
- December 2019 Thompson Engineering unmanned aerial vehicle (UAV) Orthomosaic

A UAV was used to capture the most recent imagery along the project sites. Images were developed using post-processing software. In order to increase the accuracy of the data collected, six ground control points (GCPs) were placed for the south shore and six GCPs were placed for the north shore. All GCPs were surveyed by a Professional Land Survey Team prior to reconnaissance. The information collected during this process was used to create the 2019 images in the *North of Fowl River Comparison Aerials* map and the *South of Project Comparison Aerials* map (Appendix A).

CONCLUSIONS

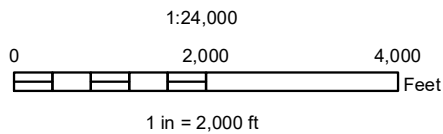
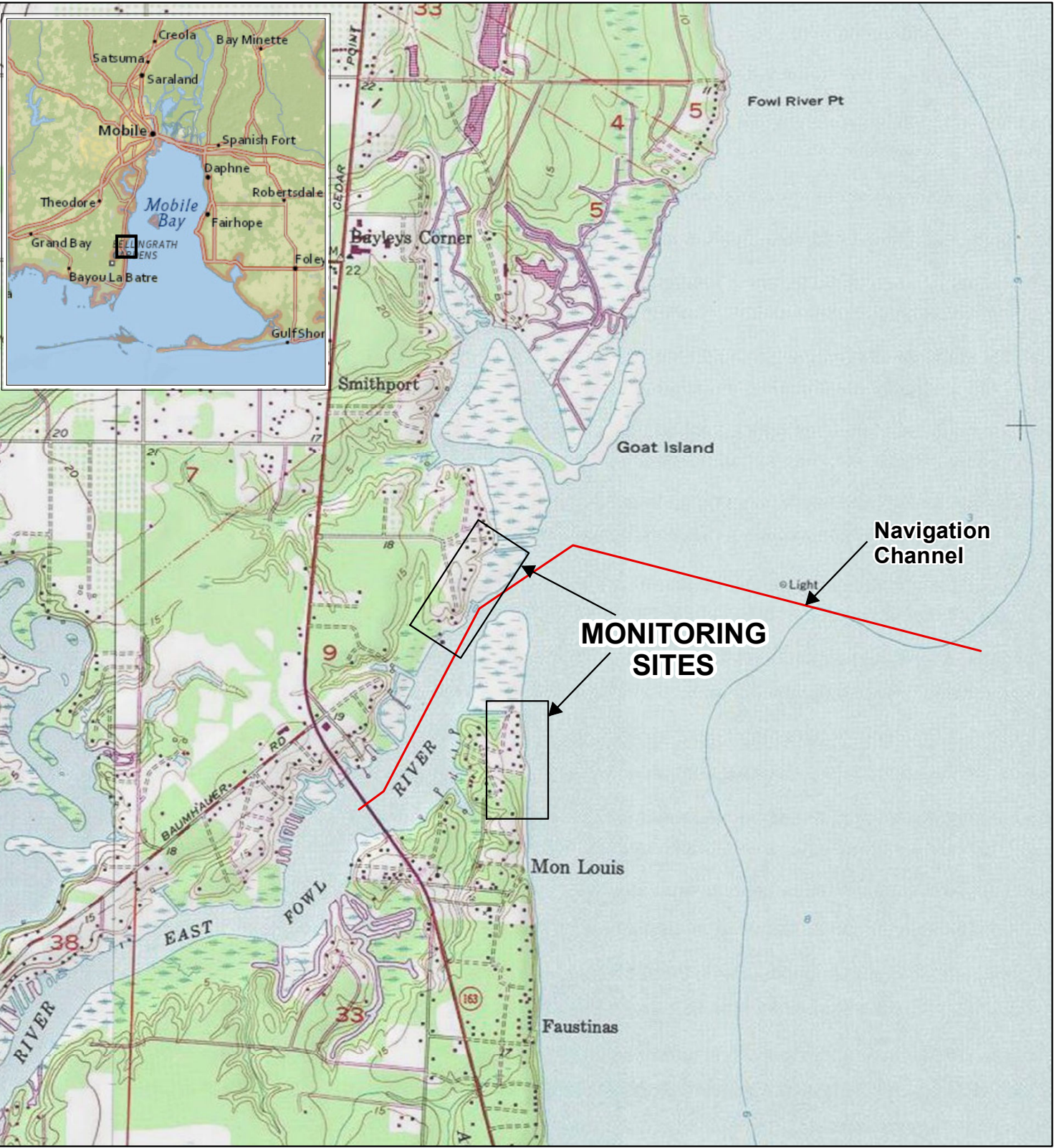
A review of the Fowl River segment, as shown on the *North of Fowl River Comparison Aerials* in Appendix A, shows that there is no discernable shoreline change from pre-construction in 2016 to both post-construction images dated 2017 and 2019. The shoreline south of the rock breakwater on MLI was assessed by reviewing the *South of Project Comparison Aerials* in Appendix A. The aerials show what appears to be a rock or rip/rap structure installed by a private individual on one of the properties south of the project. However, there is no discernable evidence of shoreline change for this segment as a result of the restoration at the tip of MLI.

REFERENCES CITED

Thompson Engineering, Inc., September 11, 2015. *Proposed Bathymetry, Shoreline, and Structural Monitoring Plan*. (Draft Monitoring Plan incorporated into U.S. Army Corps of Engineers (USACE) Permit Number SAM-2014-01046-LET dated March 9, 2016.)

APPENDIX A

Figures



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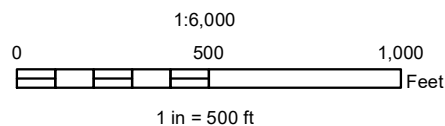
PROJECT VICINITY MAP

PROJECT NO.:
13-1101-0242

DATE:
JANUARY 2020



1997 USDA/NRCS DOQ Mosaic - 1 Meter Resolution



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1997 HISTORICAL AERIAL

PROJECT NO.:
13-1101-0242

DATE:
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Document Path: P:\2013\110113-1\101-0242 DISL-MBNEP Mon Louis Island S. O'Hearn\GISMXD\JAN 2020 REPORT\FIG2.mxd



2016



2017



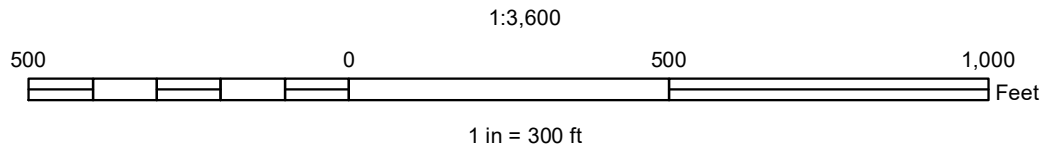
2019

(Background Imagery: 2017)



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2016 NAIP Imagery - 1Meter Resolution
2017 Mobile County Imagery - 1 Foot Resolution
2019 Thompson Engineering UAV Orthomosaic (Dec.)



NORTH OF FOWL RIVER COMPARISON AERIALS

PROJECT NO.:

13-1101-0242

DATE:

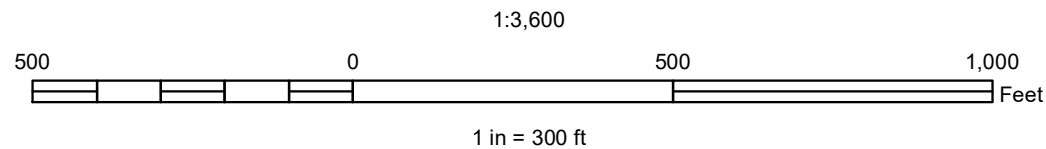
JANUARY 2020

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2016 NAIP Imagery - 1Meter Resolution
2017 Mobile County Imagery - 1 Foot Resolution
2019 Thompson Engineering UAV Orthomosaic (Dec.)



SOUTH OF PROJECT COMPARISON AERIALS

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